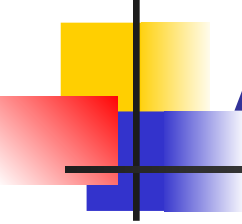


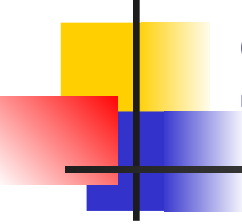
Audiometric Protocols & Techniques



A decorative graphic on the left side of the slide, consisting of overlapping yellow, red, and blue squares with a black crosshair.

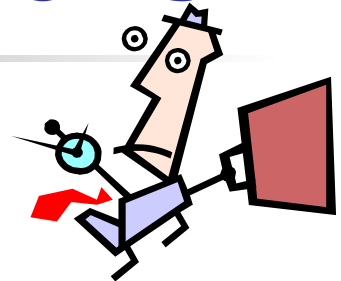
Aural History

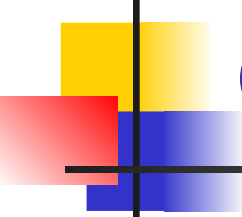
- Inquire about auditory complaints
- Ensure no ENT problems
- Ensure noise-free requirement prior to reference and follow-up audiograms
 - No noise-free requirement prior to periodic audiograms



Special Testing Situations

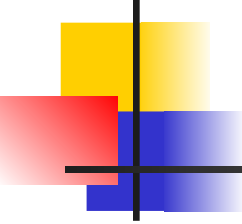
- Remove hearing aids prior to testing
- Test the better ear first
- Be aware of potential for crossover with unilateral or asymmetrical losses
 - Crossover/lateralization occurs when sound energy reaches a loudness level in the poorer ear that the poorer ear does not hear. The stimulus leaks around the headphones or through the skull and the better ear responds
 - Occurs when the difference in hearing between the ears at the same frequency is 40 dB or greater
 - Refer these patients to the Audiologist





Special Test Situations, con't.

- Claustrophobic patients – make them as comfortable as possible
- Patients with tinnitus or extreme hearing loss
 - Use of pulsed tones versus pure tones
 - Test them alone (not in a group test), if possible
- Collapsing ear canals & patients with draining ears or external otitis – refer to physician
- Difficult to test patients/malingeringers – re-instruct & re-test, if problems persist, refer to Audiologist



Pre-Test Protocols

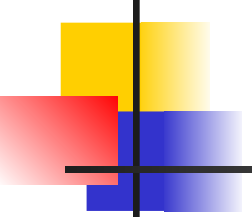


- Otoscopy
- Complete test instructions
 - “You are going to hear a series of beeping tones. Every time you hear a tone, press the button (raise your hand) as soon as you hear it then quickly release the button. No matter how faint the tone, press the button when you hear it.”
- Remove glasses, hats, large earrings, gum
- Proper seating placement

Earphone Placement

- Remember; “RED ON RIGHT”
- Diaphragm centered over ear canal
- Headband on top of patients head
- Cords draped down patients back
- Fit snugly without squeezing





Manual Test Technique: Threshold Search/Bracketing

- Start at 0 dB, present tone as you increase volume until patient responds
- Verify the response by presenting the tone again at the same level of the initial response
- Decrease the volume by 10 dB and present the tone;
 - Patient responds: Decrease volume by 10 dB and repeat
 - Patient doesn't respond: Increase volume 5 dB until next response
- Continue the technique of going down 10 and up 5 until the patient responds at the same dB level 2 out of 3 times in an ascending fashion. Record as threshold.
- Tone presentation should last approx. 1-3 seconds or 3 pulses

Manual Test Technique, con't.

- Vary the inter-stimulus interval to counter guessing
- Test frequencies in the following sequence:
 - 1000 is repeated to validate the response
 - Successful validation = $\pm 5\text{dB}$
 - Cannot validate? Re-instruct and start over
 - No validation required for
- Record thresholds accurately
- Work quickly but carefully



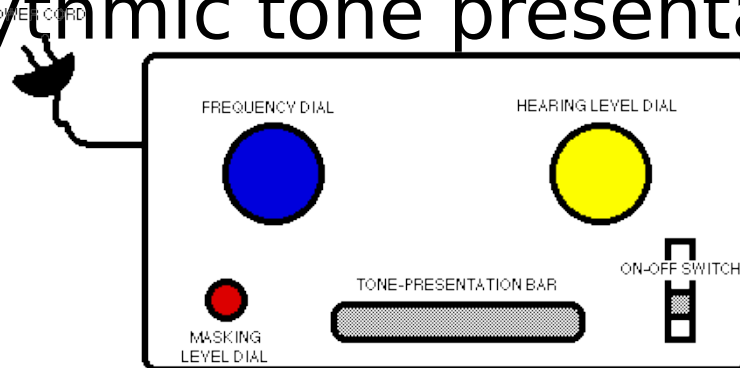
Manual Audiometry Using the Microprocessor Audiometer

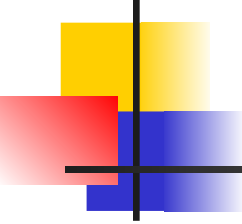
- Audiometer Controls
 - Present Stimulus
 - Frequency Selector
 - Decibel Selector (Attenuator)
 - Ear Selector (left/right)
 - Microphone - talkover

The screenshot displays a software interface for a manual audiometer. At the top, there are fields for 'Booth' (containing '1') and 'Name/SSN/Id'. To the right, there are two rows of frequency buttons labeled 'Left' and 'Right', each with options for .5k, 1k, 2k, 3k, 4k, 6k, and 8k. Below these are two large circular dials. The left dial is labeled 'Frequency (Hz)' and has a scale from 500 to 8000, with a needle pointing to 1000. Below it are 'Higher' and 'Lower' buttons. The right dial is labeled 'Decibels (HL)' and has a scale from -10 to 100, with a needle pointing to 30. Below it are 'Up' and 'Down' buttons. In the center, there is an 'Ear' selector with radio buttons for 'Left' (selected) and 'Right'. Below this are buttons for 'Response', 'Stimulus', and 'Present Stimulus'. At the bottom, there are buttons for 'Microphone', 'Set NT', 'OK', and 'Cancel'.

Factors Affecting Test Validity

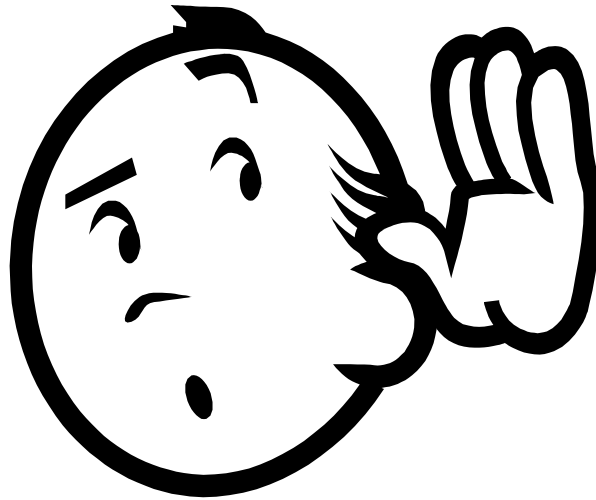
- Procedures
 - Poor test instructions
 - Improper earphone placement
 - Auditory/visual cues from the examiner
 - Rhythmic tone presentation





Patient Physical Factors

- Poor health or fatigue
- Tinnitus
- Significant hearing loss



Psychological Factors

- Poor understanding of test instructions
- Poor motivation
- Poor attention span
- Limited hearing test experience



Test Environment Conditions

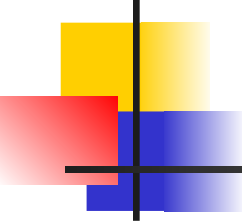
- Excessive ambient/background noise
- Poor ventilation
- Poor lighting
- Invalid € calibration



For Accurate Test Results

- Conduct tests in certified booth
- Use a properly calibrated audiometer
- Examiner must be well-trained & certified in Occupational Hearing Conservation
- Have a well-instructed, cooperative patient





Recording Test Results

- Forms
 - DD 2215 reference audiogram
 - DD 2216 monitoring audiogram
 - Non-Hearing Conservation Test
- Data accuracy is critical
 - Medical-legal documents
 - Must contain accurate/valid information

QUESTIONS???

